NATIONAL SYNCHROTRON LIGHT SOURCE
SAD RISK ASSESSMENT

APPENDIX 4

SYSTEM: Building 725 activities

SUBSYSTEM: Accelerator and beamline systems

HAZARD: Loss of vacuum, cooling water, compressed air

HAZARD IMPACT:

Potential loss of control of stored electron or sychrotron beam; damage to equipment; programmatic impact

RISK ASSESSMENT PRIOR TO MITIGATION:

Consequence	☐ **I** High	☐ **II** Moderate	☒ **III** Low	☐ **IV** Routine
Probability	☒ **A** Frequent		☐ **D** Remote	
	☐ **B** Probable		☐ **E** Extremely Remote	
	☐ **C** Occasional		☐ **F** Impossible	
Risk Category	☐ **I** High	☒ **II** Moderate	☐ **III** Low	☐ **IV** Routine

MITIGATING FACTORS

- **Safety systems are in place to protect the rings and beamlines from vacuum, cooling water and compressed air faults.
- Vacuum faults cause accelerator interlock systems to close sector and front end valves thus dumping beam; beamline interlocks would close a beamline valve and/or a front end valve; insertion device beamline interlocks would close the fast valve and dump RF
- Reduced cooling water flow sensed by Proteus units causes accelerator interlocks to dump RF and causes beamline interlocks to close safety shutters
- Elevated magnet temperature sensed by a Klixon would turn off the magnet power supply; if sensed on ring components, would dump RF; if sensed in pump room water, would dump RF and magnet power supplies
- Loss of primary compressed air supply from the Centrol Chilled Water Facility activates the NSLS backup supply and alerts the Control Room
- Loss of backup compressed air supply (affecting operation of front end masks, safety shutters and fast valves) alerts the Control Room

RISK ASSESSMENT FOLLOWING MITIGATION:

Consequence	☐ **I** High	☐ **II** Moderate	☒ **III** Low	☐ **IV** Routine
Probability	☐ **A** Frequent		☐ **D** Remote	
	☐ **B** Probable		☐ **E** Extremely Remote	
	☒ **C** Occasional		☐ **F** Impossible	
Risk Category	☐ **I** High	☐ **II** Moderate	☒ **III** Low	☐ **IV** Routine